melted materials is slowly used up, and the bath can then in general not again reach a " boil." Therefore, scrap requires higher percentage of pig iron in the charge the smaller its pieces.

Silica, which reaches the furnace as an impurity, exercises a further unfavourable inlluence. Owing to being the cause of a considerable* increase in the quantity of slag, the furnace must liberate much more heat in the production of a specified quantity of stool. Silica adheres to pig iron usually in larger amounts than one believes, and especially if the pig iron is cast in Band ; a sand covering of 2 or more per cent, is not raro, but also the scrap brings sand into the furnace, and generally the more, the smaller sized the scrap. Shearings, punchings, turnings, and the like admit generally only of being takon up from the llooring by the shovel, and thereby it is unavoidable that certain amounts of sand and earth are picked up, and then also get into the furnace. Silica, in tho form of remnants of refractory materials, often adheres to tho sera]) produced in steel works, and is frequently charged with it into the furnace because, very wrongly, the cost involved in the removal of the same is shunned.

The diminution of output, which is occasioned through employment of unclean material, makes itself more felfc than the increase of heat demand mentioned. There are, for the greatest part, sand on the one hand, and, on the other hand, rust on the scrap, paint on old roofing sheets, and tin and solder on tin sheet scrap, completely weighed in with the iron, and as such placed in the reckoning, and in this manner a considerable loss of charge is given rise to. As to this, for each 1 per cent, of HiO^, 0*5 per cent, iron must go into the slag (according to formula 45), and if this amount also is not very considerable, it is, nevertheless, so large that it cannot be overlooked.

If, for example, the ideal charge before-considered, which yielded 8*8 per cent, charge loss, be taken as being impuriiied by 4 per cent. SilXj and 1 per cent, of other impurities, it will fix the charge loss at 8'8+4 + 4xO'5+l=10'8 per cent., and since on casting about 1 to 2 per cent*, can be lost, at a total of 12 per cent., so that the output would amount to only